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COMMENTS

Including Geothermal Resources Within the Mineral Estate: The Need for a Statutory Rule of Presumption

I. INTRODUCTION

The problem of deciding whether a resource recently found to be valuable is included within a general conveyance of all the mineral rights in a piece of property is not new to the courts. Near the turn of the century, for example, courts were asked to decide whether oil and gas were "minerals" within the terms of deeds and leases.¹ More recent examples of this process are the efforts

1. The issue was presented in 1882 in Pennsylvania in the case of *Dunham v. Kirkpatrick*, 101 Pa. 36 (1882), and the court there concluded that a reservation of all minerals did not include petroleum. The court conceded that oil and gas were technically minerals, but held that the intent of the parties was not to include them in the reservation of "all minerals" since "by the bulk of mankind nothing is considered as a mineral except such things as be of a metallic nature, such as gold, silver, copper, lead, etc." *Id.* at 44. Since then, Pennsylvania has developed a small but consistent line of cases following this view. See, e.g., *New York State Natural Gas Corp. v. Swan-Fitch Gas Dev. Corp.*, 173 F. Supp. 184 (W.D. Pa. 1959); *Highland v. Commonwealth*, 400 Pa. 261, 161 A.2d 390 (1960); *Bundy v. Myers*, 372 Pa. 583, 94 A.2d 724 (1953); *Preston v. South Penn Oil Co.*, 238 Pa. 301, 86 A. 203 (1913); *Silver v. Bush*, 213 Pa. 195, 62 A. 832 (1906).

In situations not involving the intent of the parties, Pennsylvania has consistently held oil and gas to be minerals. See *Bannard v. New York State Natural Gas Corp.*, 448 Pa. 239, 293 A.2d 41 (1972) (holding that oil and gas are minerals for purpose of a tax sale); *Marshall v. Mellon*, 179 Pa. 371, 36 A. 201 (1897); *Blakley v. Marshall*, 174 Pa. 425, 34 A. 564 (1896) (holding that they are minerals and thus are part of the corpus of the land as between life tenants and remaindermen); *Gill v. Weston*, 110 Pa. 312, 1 A. 921 (1885) (holding that they are minerals within the meaning of a statute providing for mortgages on mineral property). Consequently Pennsylvania law does not preclude oil and gas from being legally recognized as minerals, but has only concluded that oil and gas are not popularly understood to be minerals.

A similar result was reached in Ohio in *Detlor v. Holland*, 57 Ohio St. 492, 49 N.E. 690 (1898). But see *Jividen v. New Pittsburg Coal Co.*, 45 Ohio App. 294, 187 N.E. 124 (1933) (dictum).

The majority of the states, however, have reached the opposite result, holding that absent evidence of a specific intent to the contrary, "all the minerals" includes oil and gas. See, e.g., *Sheppard v. Zeppa*, 199 Ark. 1, 133 S.W.2d 860 (1939); *Roth v. Huser*, 147 Kan. 433, 76 P.2d 871 (1938); *Scott v. Laws*, 185 Ky. 440, 215 S.W. 81 (1919); *Weaver v. Richards*, 156 Mich. 320, 120 N.W. 818 (1909); *Barker v. Campbell-Ratcliff Land Co.*, 64 Okla. 249, 167 P. 468 (1917); *Murray v. Allard*, 100 Tenn. 100, 43 S.W. 355 (1897); *Anderson & Kerr Drilling Co. v. Bruhlmeier*, 134 Tex. 574, 136 S.W.2d 800 (1940); *Western Dev. Co. v. Nell*, 4 Utah 2d 112, 288 P.2d 452 (1955); *Warren v. Clinchfield Coal Corp.*, 166 Va. 524, 186 S.E. 20 (1936); *Sult v. A. Hochstetter Oil Co.*, 63 W. Va. 317, 61 S.E. 307 (1908).

of the courts, since the advent of the atomic age, to determine the ownership of uranium and thorium deposits. In *New Mexico & Arizona Land Co. v. Elkins*,² the court reasoned that since uranium and thorium are minerals in a technical, scientific, and geologic sense, they are minerals in a legal sense.³

The difficulty in these cases arises because the term "mineral" is not a term of art, but is, as the Supreme Court has recognized, "used in so many senses, dependent upon the context, that the ordinary definitions of the dictionary throw but little light upon its signification in a given case."⁴ While most authorities agree that the definition of mineral should not be as broad as its strictly technical sense would permit (which would include virtually all inorganic substances)⁵ or so narrow as to include only precious metals,⁶ within those broad parameters there does not appear to be a single unifying principle or talisman by which a substance may be readily categorized as mineral or nonmineral.⁷ As a result, courts must determine the ownership of natural resources by construing individual conveyances and evaluating each new resource as its usefulness is discovered.

One resource that has recently become valuable is geothermal energy.⁸ With the increased cost and limited reliability of petroleum, greater attention has been focused on alternative energy sources, including geothermal energy. This increased interest has raised the issue whether geothermal resources belong to the mineral owner or to the surface owner.⁹ Because of the vast potential of geothermal resources in the United States, especially in the Western States,¹⁰ the answer given this question could

2. 137 F. Supp. 767 (D.N.M. 1956).

3. Uranium was also included within the mineral estate in *Cain v. Neumann*, 316 S.W.2d 915 (Tex. Civ. App. 1958).

4. *Northern Pac. Ry. v. Soderberg*, 188 U.S. 526, 530 (1903).

5. See *id.*; *White v. Miller*, 200 N.Y. 29, 92 N.E. 1065 (1910); *Rock House Fork Land Co. v. Raleigh Brick & Tile Co.*, 83 W. Va. 20, 97 S.E. 684 (1919).

6. See *Northern Pac. Ry. v. Soderberg*, 188 U.S. 526, 530 (1903); *Brady v. Smith*, 181 N.Y. 178, 180, 73 N.E. 963, 964 (1905); *Dunham v. Kirkpatrick*, 101 Pa. 36, 44 (1882).

7. *Northern Pac. Ry. v. Soderberg*, 188 U.S. 526, 530 (1903); *Bumpus v. United States*, 325 F.2d 264, 266 (10th Cir. 1963); *Highland v. Commonwealth*, 400 Pa. 261, 275, 161 A.2d 390, 398 (1960).

8. For a discussion of the nature of geothermal resources, the various types of geothermal systems, and the technical problems involved in extracting geothermal resources, see Austin, *Technical Overview of Geothermal Resources*, 13 LAND & WATER L. REV. 9 (1977), and Sato & Crocker, *Property Rights to Geothermal Resources* (pt. 1), 6 ECOLOGY L.Q. 247, 253-70 (1977).

9. See Kitchen, *Geothermal Leasing Practices*, 13 LAND & WATER L. REV. 25, 37-42 (1977); Olpin, *The Law of Geothermal Resources*, 14 ROCKY MTN. MIN. L. INST. 123, 129-33 (1968); Note, *Acquisition of Geothermal Rights*, 1 IDAHO L. REV. 49, 52-66 (1964).

10. [T]he United States Geological Survey has classified almost 60 million

have an enormous impact on the future development of energy in this country.

The question was finally broached in *Geothermal Kinetics, Inc. v. Union Oil Co.*¹¹ The subject of the action in *Geothermal Kinetics* was a well located in a California geothermal field known as "The Geysers."¹² In 1951 the owners in fee had conveyed to Geothermal Kinetics' predecessor in interest all the mineral rights in the property. In 1963, the holders of the surface, unaware of the earlier severance, leased to Union Oil's assignors the right to "drill for, produce, extract, remove and sell steam and steam power and extractable minerals" from the land. Geothermal Kinetics brought an action to quiet its title in the geothermal resources and obtained a judgment in its favor.¹³ On appeal that judgement was affirmed, the court holding that, absent any expressed specific intent to the contrary, the general grant of minerals included the geothermal resources.¹⁴

In reaching that conclusion, the California Court of Appeals rejected what it called a "mechanistic approach based upon textbook definitions of the term mineral."¹⁵ Instead, the court applied both a constructional approach—examining the language used in the specific conveyance—and a functional approach—attempting to discern the intent of the parties by resorting to their general expectations regarding the use of their respective estates.¹⁶ The *Geothermal Kinetics* court also relied heavily on the nature of the particular geothermal system in question. That system is known as a hot water system, since the energy is extracted in the form of superheated water. The geothermal water and the ground

acres of *Federal land* in the 14 Western States as having a geothermal potential. There is, in addition, State and private land with a geothermal potential and very tentative estimates speak of a total of 100 million acres which might contain geothermal resources.

Geothermal Energy: Hearings on H.R. 8628 and H.R. 9658 Before the Subcomm. on Energy of the House Comm. on Science and Astronautics, 93d Cong., 1st Sess., 24 (1973) (statement of Dr. Joseph Barnea).

11. 75 Cal. App. 3d 56, 141 Cal. Rptr. 879 (1977). There are two other cases dealing with ownership of geothermal resources arising out of the same geothermal field. The first, *United States v. Union Oil Co.*, 549 F.2d 1271 (9th Cir.), *cert. denied*, 434 U.S. 930 (1977), involved the ownership of geothermal resources under a reservation of minerals by the federal government. The second, *Pariani v. State*, No. 657291 (Super. Ct. of San Francisco City and County, June 30, 1977), dealt with a mineral reservation by the state government.

12. 75 Cal. App. 3d at 58, 141 Cal. Rptr. at 879. All facts are derived from the opinion.

13. *Geothermal Kinetics, Inc. v. Union Oil Co.*, No. 75314, (Super. Ct. for the County of Sonoma, Cal., June 1, 1976).

14. 75 Cal. App. 3d 56, 141 Cal. Rptr. 879 (1977).

15. *Id.* at 59, 141 Cal. Rptr. at 880.

16. *Id.*

water in that system are almost totally separated by a semi-impermeable silicacarbonate seal 1,000 feet thick.¹⁷ The geothermal water taken from the wells contains toxic minerals, making it unfit for agricultural or domestic uses.¹⁸ The court emphasized these facts in holding that the ownership of the percolating water was insufficient to give the surface owner an interest in the geothermal water. The court reasoned that possession of the geothermal waters was not necessary to the enjoyment of the surface and therefore the parties must not have intended that they be part of the surface estate.

The approach taken by the court in *Geothermal Kinetics* was consistent with that taken by courts in past attempts to define the scope of the mineral estate. Traditionally, courts have framed the problem of categorizing a substance whose value has recently been discovered as one of ascertaining the intent of the parties to the conveyance that originally severed the surface and the minerals. Taking this tack, the real issue is whether the parties intended to include the particular substance within the mineral estate. However, the notion that the parties intended to include a resource within a general grant of minerals is in most cases absurd; indeed, it is probable that "as a matter of fact, the parties had nothing specific in mind on the matter at all."¹⁹ In the absence of any apparent intent relating to a specific substance, the duty of the court verges on speculating what the parties would have intended on the point, had it been present in their minds.²⁰ To aid in this attempt the courts have developed a variety of rules and devices, most of which focus heavily on the facts of the particular mineral deposit and take the same constructional and functional approaches used by the *Geothermal Kinetics* court.

It is likely that other courts confronted with the task of allocating geothermal resources to the surface or mineral estate will turn to these traditional tools in much the same way as did the court in *Geothermal Kinetics*. This would be unfortunate, for it

17. *Id.* at 59-60, 141 Cal. Rptr. at 880-81.

18. *Id.* at 60, 141 Cal. Rptr. at 881.

19. Kuntz, *The Law Relating to Oil and Gas in Wyoming*, 3 Wyo. L.J. 107, 112 (1949).

20. In so doing, the function of the court becomes something akin to the interpretation of statutes. The classic words of John Chipman Gray are pertinent on that subject:

[T]he difficulties of so-called interpretation arise when the Legislature has had no meaning at all; when the question which is raised on the statute never occurred to it; when what the judges have to do is, not to determine what the Legislature did mean on a point which was present to its mind, but to guess what it would have intended on a point not present to its mind, if the point had been present.

J. GRAY, *THE NATURE AND SOURCES OF THE LAW* 173 (2d ed. 1938).

could result in extensive litigation with irregular and unpredictable holdings, and it could unreasonably delay development of this badly needed resource. A preferable alternative would be a legislative determination of whether geothermal resources are presumptively included within the surface or the mineral estate.

This Comment will first identify policy objectives that should be considered in deciding the issue of geothermal ownership. Next, it will evaluate the adequacy, in the geothermal context, of several traditional approaches courts have taken in defining the mineral estate. It will then examine existing state geothermal resource statutes and evaluate their effectiveness in dealing with the classification problem. It will conclude by suggesting that policy objectives can best be achieved by a legislative allocation of geothermal resources to the mineral estate.

II. QUESTIONS OF POLICY

In determining the issue of geothermal ownership, certain policy objectives must be considered. Perhaps the most important of these is that there be no unreasonable delay in the development of this much-needed resource. To accomplish this, title to geothermal resources must be quickly and inexpensively established in one party or another, not subject to alteration without clear and substantial grounds. The amount of investment required to build, for example, an electrical generating plant powered by geothermal energy is enormous,²¹ and a secure title is an absolute prerequisite to such an investment.

A second related policy consideration is that the issue of ownership should be settled within the instruments available to the examiner of title. If questions of ownership can be settled only through extensive historical or geological investigation, complication and delay are inevitable. Increasing the level of complication tends both to increase the number of disputes that are litigated and to decrease their degree of predictability.

There is also a strong interest in giving effect to the intentions of the parties. Thus, if the owner of property expresses a desire to include geothermal resources within one estate or the

21. One author has estimated that a minimum of ten geothermal wells is required to sustain a 55 megawatt power plant. Kitchen, *supra* note 9, at 31. The cost of drilling the well on the property in dispute in *Geothermal Kinetics* was about \$400,000. 75 Cal. App. 3d at 58, 141 Cal. Rptr. at 880. Thus, assuming the cost of that well to be about average, the cost of simply drilling enough wells to provide energy for a power plant is \$4 million. This does not include any costs for acquiring the property or for constructing the power plant and the connecting pipelines.

other, that desire should be respected. However, this policy should be weighed against the objectives of certainty of ownership and expeditious development. When balanced in this manner, it is obvious that only when the owner has expressed an actual intent regarding geothermal ownership should the interest in giving effect to the parties' intentions be controlling. The law should have no compulsion to use so-called intent tests to construe mineral conveyances when the grantor actually had no intentions.

III. THE TRADITIONAL APPROACHES

In ascertaining the intentions of the parties many of the earlier courts took what may be called a definitional approach, in which they attempted to define precisely the word "mineral" and then determine whether the substance in question came within that definition. The definitional approach has now been widely discredited, due in large part to the Supreme Court's recognition that the term "mineral" has too many uses to be susceptible to precise delineation.²² Most of the rules the courts now use in their

22. See discussion accompanying note 4 *supra*. The definitional approach seems to have first evolved in England. In the case of *Earl of Rosse v. Wainman*, 153 Eng. Rep. 724 (Ex. 1845), it was said that the term "mineral," "though more frequently applied to substances containing metals, in its proper sense includes all fossil bodies or matters dug out of mines." *Id.* at 730. Perhaps the best known English definition, one which was applied in several subsequent cases in both England and the United States, was articulated in *Hext v. Gill*, L.R. 7 Ch. 699 (Ch. App. 1872).

[T]he result of the authorities, without going through them, appears to be this: that a reservation of "minerals" includes every substance which can be got from underneath the surface of the earth for the purpose of profit, unless there is something in the context or in the nature of the transaction to induce the Court to give it a more limited meaning.

Id. at 712.

Other early English definitions foreshadowing some of the more recent American attempts hold that "mineral" includes all substances of a mineral nature which have "a use and value of their own independent of their being constituents of the soil," *Earl of Jersey v. Guardians*, 22 Q.B.D. 555, 561 (1889), or define the term as encompassing "everything except the mere surface, which is used for agricultural purposes." *Midland Ry. v. Checkley*, L.R. 4 Eq. 19, 25 (M.R. 1867). American opinions generally relied heavily on these English precedents, stating that "mineral" in a grant or reservation means "all mineral substances which can be taken from the land, and to restrict the meaning of the term there must be qualifying language or circumstances evincing that the parties contemplated something less general than all substances legally cognizable as minerals." *Kalberer v. Grassham*, 282 Ky. 430, 433, 138 S.W.2d 940, 942 (1940) (citing *Phelps v. Church of Our Lady*, 115 F. 882 (3d Cir. 1902), and *Kentucky Diamond Min. & Dev. Co. v. Kentucky Transvaal Diamond Co.*, 141 Ky. 97, 132 S.W. 397 (1910)).

The decline of the definitional approach was signaled by the Supreme Court's recognition that the term "mineral" was used in too many senses to allow for a single definitive legal meaning. See *Northern Pac. Ry. v. Soderberg*, 188 U.S. 526, 530 (1903). The contemporary treatment of the courts is either to reject outright the idea that there is a definite class of substances which are "minerals," *United States ex. rel. TVA v. Harris*, 115 F.2d

attempt to discover intent may be classed as functional or as constructional. Both approaches aim ultimately at discerning intent, but by the use of different processes. The functional approach focuses on the uses to which the resource in question may be put in relation to the expectations with which surface and mineral owners generally hold their separate estates. Two examples of the functional approach are the discernment of a general intent based on the manner of enjoyment, and the examination of the form or location of the substance whose ownership is contested. The constructional approach, on the other hand, emphasizes the language of the instrument of conveyance, seeking to discover in the words themselves a clue to the intentions of the parties. One example of the constructional approach often used in interpreting mineral conveyances is the rule of *ejusdem generis*. A third approach used by only a few courts is to examine the historical circumstances at the time of the conveyance. Under this historical approach, a major concern of the court is whether the substance in question was commonly known and commercially exploited in the general vicinity at the time of the severance of the two estates. These different approaches will be examined in turn and evaluated in terms of their adequacy in defining the ownership of geothermal resources.

A. *The Functional Approach*

1. *General intent based on manner of enjoyment*

The idea of determining the scope of the mineral estate by seeking the parties' general intent based on the manner of enjoyment is probably the result of Professor Kuntz' important work, *The Law Relating to Oil and Gas in Wyoming*.²³ Addressing the question whether oil and gas should be included within a general grant or reservation of minerals, he said:

It is submitted that an intention test is the proper one, but not as applied heretofore. The intention sought should be the

343 (5th Cir. 1940), or to find that the use of the word is per se ambiguous, thus allowing an examination of the transaction itself. *Besing v. Ohio Valley Coal Co.*, 155 Ind. App. 527, 293 N.E.2d 510 (1973).

The surface owners in *Geothermal Kinetics* contended for a definitional approach, arguing that a mineral must have physical substance. 75 Cal. App. 3d at 58-59, 141 Cal. Rptr. at 880. Since the resource was not steam, rock, or the underground reservoir but heat energy, they contended, geothermal energy should not come within the definition of the word "mineral." The court summarily rejected this approach as "mechanistic" and instead adopted functional and constructional approaches. *Id.* at 59, 141 Cal. Rptr. at 880.

23. Kuntz, *supra* note 19.

general intent rather than any supposed but unexpressed *specific intent*, and, further, that general intent should be arrived at, not by defining and re-defining the terms used, but by considering the *purposes* of the grant or reservation in terms of manner of enjoyment intended in the ensuing interests.²⁴

Kuntz believed that enjoyment of the mineral estate was "through extraction of valuable substances" while the surface owner enjoyed his estate "through retention of such substances as are necessary for the use of the surface."²⁵ His definition of general intent would sever from the surface "all substances presently valuable in themselves, apart fom [sic] the soil, whether their presence is known or not, and all substances which become valuable."²⁶ Substances whose removal would unreasonably interfere with the enjoyment of the surface could not be removed without compensation.

This general intent approach was adopted by the Tenth Circuit in *Northern Natural Gas Co. v. Grounds*.²⁷ The question before the court in that case was whether helium was included in a lease of the "oil and gas, casinghead gas and casinghead gasoline."²⁸ The court agreed that the specific intent of the lessors was probably to convey only the combustible gases, but held that the controlling issue was whether the court should look to the specific or general intent of the lessors. On that issue, the court decided that

general intent is closer to original intent than is specific intent which blossoms when a component previously regarded as an impurity becomes valuable. The discovery of the use and value of a component does not expand the grant but the expansion of that discovery into tangible value makes more certain the specific object of the general grant. We conclude that, absent specific reservations, the grant of gas by the leases covered all components of the gas, including helium.²⁹

The general intent approach was used in the leading case defining geothermal rights under federal mineral reservations, *United States v. Union Oil Co.*³⁰ The question in *Union Oil* was

24. *Id.* at 112 (emphasis in original).

25. *Id.*

26. *Id.* at 113.

27. 441 F.2d 704 (10th Cir. 1971).

28. *Id.* at 710.

29. *Id.* at 715.

30. 549 F.2d 1271 (9th Cir.), *cert. denied*, 434 U.S. 930 (1977). The court in *Geothermal Kinetics* properly recognized that the holding in *Union Oil* was not dispositive of the issue of geothermal ownership derived from a private conveyance. 75 Cal. App. 3d

whether the Stock-Raising Homestead Act of 1916³¹ reserved the rights to geothermal resources for the federal government. The lands patented under that act were "subject to . . . a reservation to the United States of all the coal and other minerals."³² The court found that "Congress's [sic] general purpose was to transfer to private ownership tracts of semi-arid public land capable of being developed by homesteaders into self-sufficient agricultural units . . . but to retain subsurface resources, particularly mineral fuels, in public ownership for conservation and subsequent orderly disposition in the public interest."³³ Because of this general intent, the court held the geothermal resources had been reserved by the federal government.

The court in *Geothermal Kinetics* utilized the parties' general intent based on manner of enjoyment to determine that geothermal resources were part of the mineral estate: "Since normally the owner of the mineral estate seeks to extract valuable resources from the earth, whereas the surface owner generally desires to utilize land and such resources as are necessary for his enjoyment of the land, the geothermal resources should follow the mineral estate."³⁴

Despite its apparent popularity with the courts, the general intent method of determining geothermal ownership does not lead to consistent and predictable results. One problem with this method can be seen in the confusion over the ownership of water, the medium through which geothermal heat energy is in most instances extracted. While on the one hand, "water itself . . . may be classified as 'minerals,' "³⁵ on the other "[n]o authority

at 58 n.1, 141 Cal. Rptr. at 880 n.1. The two cases are different because the presumption regarding federal land grants is that they must be construed strictly in favor of the government and nothing is passed but what is conveyed in clear and explicit language. *Andrus v. Charlestone Stone Prods. Co.*, 98 S. Ct. 2002, 2010 (1978); *United States v. Union Pac. R.R.*, 353 U.S. 112, 116 (1957); *Caldwell v. United States*, 250 U.S. 14, 20-21 (1919). In contrast, the general rule with private conveyances is that the conveyance is construed most strongly against the grantor. *Geothermal Kinetics, Inc. v. Union Oil Co.*, 75 Cal. App. 3d at 59, 141 Cal. Rptr. at 880; *Clevenger v. Continental Oil Co.*, 149 Colo. 417, 369 P.2d 550 (1962); *Wilkes-Barre Township School Dist. v. Corgan*, 403 Pa. 383, 170 A.2d 97 (1961). The central issues in the cases were also different. The "substantial question" in *Union Oil* was whether interpreting the mineral reservation of the Stock-Raising Homestead Act to encompass geothermal resources "would further Congress's [sic] purposes." 549 F.2d at 1274. There was no question of legislative intent in *Geothermal Kinetics* but only the problem of construing a conveyance between private parties.

31. 43 U.S.C. §§ 291-302 (1970).

32. 43 U.S.C. § 299 (1970).

33. 549 F.2d at 1274.

34. 75 Cal. App. 3d at 59, 141 Cal. Rptr. at 880.

35. *United States v. Union Oil Co.*, 549 F.2d at 1273-74. See also *Andrus v. Charle-*

need be cited to support the proposition that courts have held traditionally that water, surface and underground, belongs to the surface owner where the mineral and surface rights have been separated into different ownerships."³⁶ It may be argued, as it was in *Geothermal Kinetics*, that water that is of no value to the use and enjoyment of the surface belongs to the mineral owner. This argument, however, would make the ownership of geothermal water dependent upon the uses for which it was or was not fit. For example, if the geothermal waters were potable, as they are in Iceland,³⁷ and thus could be used for culinary and irrigation purposes, the "use and enjoyment of the surface" argument would cut in favor of the surface owner. If the waters were not pure when pumped from the earth, but could, with little effort or expense, be made suitable for agricultural use, it would again seem that the surface owner would have a strong position. Obviously, the question of ownership becomes more and more difficult as potential uses become more varied and unusual.³⁸ For example, the surface owner may intend to heat a greenhouse, warm his house, or open a public bathhouse.

stone Stone Prods. Co., 98 S. Ct. 2002 (1978) (recognizing that water may be a "mineral" but holding that Congress did not intend to include it within the meaning of 30 U.S.C. § 21a (1976)), *rev'd* 553 F.2d 1209 (9th Cir. 1977); *Hathorn v. Natural Carbonic Gas Co.*, 194 N.Y. 326, 87 N.E. 504 (1909) (holding that subterranean waters are a mineral irrespective of the character and quality of salts and gases which may be in solution); *Ambassador Oil Corp. v. Robertson*, 384 S.W.2d 752 (Tex. Civ. App. 1964) (holding that salt water is part of the mineral estate), *writ ref'd, n.r.e.* *Robertson v. Blackwell Zinc Co.*, 390 S.W. 2d 472 (Tex. 1965).

36. *Geothermal Kinetics, Inc. v. Union Oil Co.*, No. 75314, slip op. at 12 (Super. Ct. for the County of Sonoma, Cal., June 1, 1976). *See also* *Mack Oil Co. v. Laurence*, 389 P.2d 955 (Okla. 1964); *Vogel v. Cobb*, 193 Okla. 64, 141 P.2d 276 (1943); *Fleming Foundation v. Texaco, Inc.*, 337 S.W.2d 846 (Tex. Civ. App. 1960); *Stephen Hays Estate v. Togliatti*, 85 Utah 137, 38 P.2d 1066 (1934), all holding that water is not a part of the mineral estate.

37. *See* *Kitchen*, *supra* note 9, at 30.

38. *Kitchen*, *supra* note 9, lists a number of actual and potential uses for geothermal energy besides the generation of electricity.

In Klamath Falls, Oregon, over 400 shallow wells serve an estimated 10,000 persons by providing low temperature water for heating residential and commercial structures. The entire campus of the Oregon Institute of Technology in Klamath Falls is heated by one geothermal well, a use that saves the Institute an estimated \$225,000 a year on its heating bills.

Geothermal resources also are used for space heating and greenhouse heating in Boise, Idaho, Reno-Steamboat Springs, Nevada, and Susanville, California and the use of geothermal resources is being investigated for thermal fish farming in Paso Robles, California, and greenhousing in Lakeview, Oregon, and Calistago, California. Soil warming to extend growing seasons, evaporation in sugar refining, water desalination, absorption refrigeration, mushroom growing and process drying of various materials are other uses that have been suggested.

Id. at 29-30 (footnotes omitted).

These difficulties present only part of the problem inherent in an approach focusing on utilization. Because the manner in which geothermal water may be used and enjoyed is dependent in large measure upon the nature of that water, especially its chemical content and its temperature, any approach based on utilization would introduce uncertainty and delay into the determination of geothermal ownership. In the first place, information about the nature of the water may only be available after enormous sums of money have been expended in the drilling of a geothermal well. It would be extremely risky to drill a well if there were any doubt beforehand about who owned the resource. There would also be the problem of line-drawing, determining at what point the water becomes too salty to be useful for irrigation purposes or at what degree the water is not hot enough to be a viable energy source,³⁹ a concern which may be considered particular to the mineral owner.⁴⁰ Aside from questions of competency, the appropriateness of deciding issues of property ownership on the basis of the heat or salinity of the water seems doubtful. Thus, the problems inherent in making ownership dependent on the resource's uses are compounded by interrelated difficulties stemming from the variable nature of the geothermal water. The result is that the general intent method of determining mineral ownership will not produce the certainty and consistency which are much needed in the geothermal context.

2. *The form or location of the substance*

A second variant of the functional approach looks at the way in which the resource is situated or how it may be extracted. This method is frequently used in quarrying and strip-mining cases, either implicitly or explicitly.⁴¹ Perhaps the most dogmatic appli-

39. In its Petition for a Hearing by the Supreme Court, Union Oil Company made this argument:

Finally, Appellants wish to point out that if the subsurface water at the Geysers were cool, certainly Respondent as the holder of the mineral rights would not be allowed to extract the water. If this is so, then at what temperature does the water suddenly become "mineral"? Does it become "mineral" at 50°C, 100°C or 150°C? The Court of Appeal does not and, of course, cannot answer this question. As a result, the question of ownership of lower temperature geothermal waters is unresolved.

Petition by Appellants for a Hearing by the Supreme Court at 18, *Geothermal Kinetics, Inc. v. Union Oil Co.*, Civil No. 40447 (Cal. December 27, 1977).

40. The *Geothermal Kinetics* court seemed to assume that the extraction of energy is particularly the expectation of the mineral owner. 75 Cal. App. 3d at 61-62, 141 Cal. Rptr. at 881-82.

41. See generally Annot., 70 A.L.R.3d 383 (1976).

cation of this method is in Texas, where it is now the well-established rule that whenever a substance lies so near the surface that its extraction requires the consumption or destruction of the surface, it is not a mineral for *any* purpose, regardless of at what depth additional deposits might be found, unless there has been specific mention by the parties of the substance in question.⁴²

The form and location of the particular geothermal system was a decisive factor in the outcome of *Geothermal Kinetics*. The court seemed particularly impressed that the silica seal, 1,000 feet thick, effectively separated the groundwater from the geothermal water. This provided "a sound geologic basis for distinguishing between the usual ground water system and geothermal waters."⁴³ The court also emphasized that the method of extracting energy from the geothermal system was similar to methods used with substances traditionally thought of as part of the mineral estate.

The production of the energy from geothermal energy is analogous to the production of energy from such other minerals as coal, oil and natural gas in that substances containing or capable of producing heat are removed from beneath the earth. In fact, the wells used for the extraction of the steam are similar to oil and gas wells.⁴⁴

Thus, the decision in *Geothermal Kinetics* was based in large part on a functional approach emphasizing the way in which the resource was situated and how it was extracted.

Deciding the ownership of geothermal resources by looking at their form or location or by comparing the method of extraction to other mineral extraction is a hazardous course to follow and may lead to irreconcilable results, delay, and, consequently, un-

42. *Reed v. Wylie*, 554 S.W.2d 169 (Tex. 1977); *Williford v. Spies*, 530 S.W. 2d 127 (Tex. Civ. App. 1975).

This rule had its beginnings in *Acker v. Guinn*, 464 S.W.2d 348 (Tex. 1971), where the Texas Supreme Court held that a conveyance of "the oil, gas and other minerals" did not convey an interest in the iron ore located near the surface which could be removed only by methods that would destroy the surface. While the court recognized that iron ore is a mineral with commercial value, it took the general intent approach advocated by Professor Kuntz and found that the parties to a severance of the surface and mineral estates would not ordinarily contemplate the uncompensated destruction of the surface for the benefit of the mineral estate. *Id.* at 352. While the *Acker v. Guinn* opinion was framed as an attempt to ascertain the intent of the parties, the process of stare decisis has transformed it into a rule of Texas property law to be applied without respect to the general intentions of the parties.

43. 75 Cal. App. 3d at 63, 141 Cal. Rptr. at 883.

44. *Id.* at 60, 141 Cal. Rptr. at 881.

certain ownership.⁴⁵ Requiring "a sound geologic basis" upon which to determine ownership may delay resolution of ownership conflicts until the wells are drilled to obtain that information. And, while it is true that geothermal energy is often extracted by drilling wells similar to oil and gas wells, it is also true that normal subsurface water is similarly extracted by drilling wells and many geothermal resources, such as geysers and natural hot springs, can be utilized without drilling.

B. The Constructional Approach—Ejusdem Generis

The constructional approach focuses on finding the intent of the parties from the words used in the instrument severing the surface and mineral estates. One commonly used application of the constructional approach is the rule of ejusdem generis.⁴⁶ When used to ascertain the scope of a grant of minerals, the rule requires that a general term (such as "other minerals") following one or more specific terms (such as "oil and gas" or "oil, gas, and coal") be limited to minerals of the same species or class as those specifically listed. Thus, the critical determination under this rule is whether the substance in question falls within the same class or species as those substances specifically listed; the outcome usually turns on what factors the court emphasizes when making its classification.

This can be seen in the case of *Vogel v. Cobb*.⁴⁷ There, underground water was found not to be of the same species as coal, oil, petroleum, gas, and asphalt. The court reasoned that the listed minerals were of similar chemical composition, existed in limited amounts, were ordinarily extracted from the earth and sold for profit, and served no useful function in connection with the use and enjoyment of the surface.⁴⁸ Water, on the other hand, was of quite a different chemical composition, was not ordinarily thought of as valuable, and was necessary to the use of the surface. But the court could have reached the opposite result and found water to be of the same class as the named substances simply by considering other characteristics shared by water and

45. "The form in which energy exists is without legal significance; otherwise, title to every resource would be uncertain . . . [T]he development of any resource would be impeded and costly because of this cloud." Sato & Crocker, *supra* note 8, at 295.

46. For a discussion of the rule of ejusdem generis, see generally Emery, *What Surface Is Mineral and What Mineral Is Surface*, 12 OKLA. L. REV. 499, 514-20 (1959).

47. 193 Okla. 64, 141 P.2d 276 (1943).

48. As can be seen in *Vogel*, the factors the court considers in applying the rule of ejusdem generis are often identical or similar to those emphasized by courts applying the general-intent-based-on-mode-of-enjoyment approach.

the named substances. For example, water, like the minerals named in the conveyance, is an underground resource; like oil and gas, it is often extracted by drilling wells; and like oil, it is commonly found in a liquid state.

Some factors a court might use in applying the rule of ejusdem generis in a geothermal case include: the method of extraction; the chemical composition; whether the resource is a gas, liquid, or solid; whether it is useful to the surface; and whether the energy is in chemical, heat, or other form. The outcome of the geothermal case would, as in other areas, turn upon which factors the court chose to emphasize. For example, in a case construing a conveyance of "oil, gas, and other minerals" in a fact situation similar to that in *Geothermal Kinetics*, the court could find that: (1) the method of extraction of geothermal energy is similar to that used for oil and gas; (2) the chemical composition of the extracted substance is very different from oil and gas; (3) the geothermal resource may be in liquid or gaseous form, much like oil and gas; (4) the geothermal resource may or may not be useful to the surface, depending on the nature of the water; and (5) the energy would be in the form of heat or pressure rather than in chemical form as in oil and gas. Thus, by focusing on the method of extraction, the form, and the lack of value to the surface, the court could conclude that the geothermal resources were of the same class as oil and gas. On the other hand, if the court emphasized the chemical composition, the possible value of the water for normal surface uses, and the fact that the energy is in the form of heat, the result would be different. The uncertainty fostered by the use of the ejusdem generis rule would hinder the much-needed development of geothermal energy. This uncertainty raises an additional problem: the developer may be forced to secure leases from both the mineral and surface owner, increasing his costs and legal risks.

C. *The Historical Approach*

Another method of determining the intended scope of the severed mineral estate is to examine the circumstances existing at the time of the conveyance. Under this approach, the fact that the particular substance had not been discovered or commercially produced in the vicinity at the time the deed was executed is often sufficient evidence to show that the parties did not intend to convey it.⁴⁹ The rationale behind this approach is that if a

49. This approach was first adopted in *Deer Lake Co. v. Michigan Land & Iron Co.*,

substance was not popularly considered to be mineral, then the parties could not have intended to include it in a conveyance of the minerals, and if the substance was not even known to exist, then it could not have been popularly considered to be a mineral.⁵⁰

[W]here there is ambiguity as to minerals actually embraced in instruments purporting to convey or to reserve certain unspecified minerals under generalized terms as to minerals, . . . the intent of the parties will be determined so as to be consistent with and limited to those minerals commonly known and recognized by legal or commercial usage in the area where the instrument was executed.⁵¹

The historical approach has been most consistently embraced in Arkansas cases, beginning in 1941 with *Missouri Pacific Railroad v. Strohacker*.⁵² The court in that case held that "in a country where oil and gas were not given the slightest commercial consideration in connection with land values,"⁵³ oil and gas would not be considered part of the mineral reservation. Since then the Arkansas courts have on occasion expressed some doubts as to the wisdom of the *Strohacker* decision, but have given it the weight of a rule of property.⁵⁴

89 Mich. 180, 50 N.W. 807 (1891). The issue in *Deer Lake* was whether marble and serpentine were included within a reservation of "minerals." Although recognizing that these substances would be included within a legal definition of "mineral," the court held that because iron ore was the only mineral known to exist in the locality at the time of the severance, only the iron ore had been reserved. *Id.* at 186, 50 N.W. at 809. Historical circumstances were also considered in *Huie Hodge Lumber Co. v. Railroad Lands Co.*, 151 La. 197, 91 So. 676 (1922), where the court held that oil and gas were not included within a mineral reservation, stating that at the time of the conveyance "petroleum and gas were unknown in this state, especially in the section where these lands are situated." *Id.* at 200, 91 So. at 677.

50. See Comment, *The Meaning of "Minerals" in Grants and Reservations*, 30 ROCKY MTN. L. REV. 343, 349 (1958).

51. *Ahne v. Reinhart & Donovan Co.*, 240 Ark. 691, 696, 401 S.W.2d 565, 569 (1966).

52. 202 Ark. 645, 152 S.W.2d 557 (1941).

53. *Id.* at 656, 152 S.W.2d at 563.

54. See *Brizzolara v. Powell*, 214 Ark. 870, 873, 218 S.W.2d 728, 729-30 (1949), where the court explained:

To this point we have assumed, as do the parties, that the rule of the *Strohacker* case governs the construction of the railway company's reservation. No attempt is made to impair the authority of that case, nor would the attempt be successful. The ruling was followed in *Missouri Pac. R. Co. v. Furqueron*, 210 Ark. 460, 196 S.W.2d 588, and *Carson v. Missouri Pac. R. Co.*, 212 Ark. 963, 209 S.W.2d 97, 1 A.L.R.2d 784, though with increasing dissents. But it has become a rule of property on which have been founded innumerable important transactions. To change the rule now would invalidate many titles acquired upon faith in the original decision. Consequently, regardless of our individual views as to the merits of the *Strohacker* rule, it is the unanimous opinion of the court that

Use of the historical approach in the geothermal context would create a number of problems. Perhaps the biggest difficulty would be in determining whether geothermal resources were known to exist or whether they were commercially exploited at the time of the conveyance. While man has been aware of geothermal energy for some 2,000 years,⁵⁵ and has used hot springs for a variety of purposes since then, it was not until this century that electricity was produced from geothermal steam.⁵⁶ The first commercial electric generating plant powered by geothermal energy in this country opened in 1960.⁵⁷ Consequently, it may be difficult to determine without litigation in each jurisdiction whether, for example, the test of commercial exploitation would be satisfied by the use of warm geothermal springs for a commercial bathing establishment or whether only energy uses would suffice. It may even be suggested that the mere knowledge of the existence of hot water on the severed premises is enough.

Another difficulty is that in many instances it would be nearly impossible for a title examiner to ascertain whether geothermal resources had been known to exist or had been commercially exploited on a given date in the distant past. Only historical research, going far beyond the title records, would yield the answers. This could be very costly and time consuming, further delaying the development of geothermal resources.

The extensive litigation in Arkansas spawned by the *Strohacker* rule⁵⁸ is evidence that the historical approach can lead

it has become a rule of property which should not be disturbed.

55. Bjorge, *The Development of Geothermal Resources and the 1970 Geothermal Steam Act—Law in Search of Definition*, 46 U. COLO. L. REV. 1, 3 (1974).

56. *Id.*

57. Olpin, *supra* note 9, at 124-25.

58. The frustration caused by continued attempts to apply the *Strohacker* rule are seen in *Ahne v. Reinhart & Donovan Co.*, 240 Ark. 691, 401 S.W.2d 565 (1966) (McFaddin, J., concurring in part, dissenting in part):

On this matter, of how to determine when oil and gas were recognized as minerals, we have drifted like a "ship without a rudder," as quotations from our cases will show.

(a) We started out in the *Strohacker* case in 1941 by saying it was the intention of the grantor that determined the issue

(b) Then, in the *Furqueron* case [210 Ark. 460, 196 S.W.2d 588] in 1946, we quoted a headnote from the *Strohacker* case which included both the intention of the grantor and the intention of the grantee in the deed

(c) Then in the *Carson* case [212 Ark. 963, 209 S.W.2d 97] in 1948, we again tested the mineral question by the mutual intention of the parties

(d) In the *Brizzolara* case [214 Ark. 870, 218 S.W.2d 728] in 1949, we still tested the mineral question with the "intent with which the words were used,"

(e) But when we decided the *Stegall* case [228 Ark. 632, 310 S.W.2d 251]

to great uncertainty in the ownership of natural resources. It would be senseless to use it in the geothermal context.

D. Summary

The conclusion that must be drawn from the above discussion is that the traditional devices for determining the scope of the mineral estate—the functional, constructional, and historical approaches—are ineffective in the geothermal context. The application of these approaches would almost certainly lead to protracted and expensive litigation with inconsistent and unpredictable results. This would delay development of this much-needed resource. It is therefore suggested that the question of geothermal ownership should be “resolved by resort to rule, rather than by a particularistic, case-by-case approach which falsely claims to discover actual intention.”⁵⁹ Because the courts are bound by the case method of resolving disputes and would likely rely on the traditional approaches, it is recommended that state legislatures take responsibility for laying down the rule. Legislatures may appropriately weigh the considerations of public policy and balance the conflicting interests and values involved. A number of states already have legislation in the field of geothermal resources; these will now be examined to determine their effectiveness in dealing with the problem of geothermal ownership.

IV. STATE GEOTHERMAL RESOURCES STATUTES

A. Present Statutes

At present, fifteen states have enacted legislation dealing specifically with some aspect of the geothermal resource area.⁶⁰ Of

in 1958, we departed entirely from what the parties to the conveyance intended, and went to the test of *what the word mineral was generally understood to mean at the time of the conveyance*

(f) And now, in the present case, we seem to be going to a *county by county* basis to determine when oil and gas became recognized as minerals

. . . It now seems that there will have to be a case brought to this Court from each of the seventy-five counties in Arkansas to have determined when oil and gas were first generally recognized as a mineral, in each such county; and it is from that line of holdings that I must necessarily dissent.

Id. at 698-700, 401 S.W.2d at 569-70 (emphasis in original) (footnotes omitted).

59. Halbach, *Stare Decisis and Rules of Construction in Wills and Trusts*, 52 CALIF. L. REV. 921, 923 (1964).

60. Alaska, ALASKA STAT. § 38.05.181 (1962); Arizona, ARIZ. REV. STAT. §§ 27-651 to 675 (1956 & Supp. 1977-78); California, CAL. PUB. RES. CODE §§ 3700-3776 (West 1972 & Supp. 1978); Colorado, COLO. REV. STAT. §§ 34-70-101 to 110 (Supp. 1977); Hawaii, HAW.

these, seven have statutes arguably dealing with the question of ownership. For instance, Oregon's statute includes geothermal resources within the surface estate:

Ownership rights to geothermal resources shall be in the owner of the surface property underlain by the geothermal resources unless such rights have been otherwise reserved or conveyed. However, nothing in this section shall divest the people or the state of any rights, title or interest they may have in geothermal resources.⁶¹

This statute is an excellent example of what a state legislature can do to clear up the quandary concerning the ownership of geothermal resources. There should be little doubt about the outcome of any litigation on the question, but better still, there should be little need for any such litigation. This certainty is sure to expedite the development of geothermal energy in Oregon.

If any improvement of the statute is possible, it may be to make more explicit what language is effective to separate the geothermal ownership rights from the surface. This could be accomplished by simply including the word "specifically" to modify "reserved or conveyed," so that the clause would read: "unless such rights have otherwise been specifically reserved or conveyed." Such a change would make it crystal clear that anything short of specific mention of geothermal resources would not suffice to overcome the presumption that those resources belong to the surface owner. It would still allow the surface owner to transfer his geothermal property if he so desired, but would forestall the possible argument that reservation or transfer could be made by implication. This would further discourage litigation and solidify ownership.

Idaho,⁶² Montana,⁶³ and Washington⁶⁴ have all declared that

REV. STAT. § 182-1 (1976); Idaho, IDAHO CODE §§ 42-4001 to 4015 (1977); Louisiana, LA. REV. STAT. ANN. §§ 30:681.1-.5 (West Supp. 1978); Montana, MONT. REV. CODES ANN. §§ 81-2601 to 2613 (Supp. 1977); Nevada, NEV. REV. STAT. §§ 534A.010-.040 (1973); New Mexico, N.M. STAT. ANN. §§ 65-11-1 to 24 (Supp. 1977); Oregon, OR. REV. STAT. §§ 522.005-.990 (Supp. 1977); Texas, TEX. NAT. RES. CODE ANN. tit. 5, §§ 141.001-.079 (Ver-non 1978); Utah, UTAH CODE ANN. § 73-1-20 (Supp. 1977); Washington, WASH. REV. CODE ANN. §§ 79.76.010-.900 (Supp. 1977); Wyoming, WYO. STAT. § 41-3-901(a)(ii) (1977). In addition, there is federal legislation on the subject. 30 U.S.C. §§ 1001-1025 (1976).

61. OR. REV. STAT. § 522.035 (Supp. 1977).

62. IDAHO CODE § 42-4002(c) (1977).

63. MONT. REV. CODES ANN. § 81-2602 (Supp. 1977). That section states geothermal resources are "neither a mineral resource nor a water resource." *Id.* In another section, however, Montana includes "geothermal water" in its statutory definition of water. *Id.* § 89-867(1) (Supp. 1977).

64. WASH. REV. CODE ANN. § 79.76.040 (Supp. 1977).

geothermal resources are *sui generis*. Idaho's statute, which is quite similar to the other two, reads as follows:

Geothermal resources are found and hereby declared to be *sui generis*, being neither a mineral resource nor a water resource, but they are found and hereby declared to be closely related to and possibly affecting and affected by water and mineral resources in many instances.⁶⁵

These statutes presumably mean that geothermal resources, not being a "mineral resource," are in a class by themselves and would not be included within a grant or reservation of the minerals absent a specific reference to them in the instrument. That they are the property of the surface owner seems to follow from the general rule that any part of the fee which has not been severed remains with the surface estate.⁶⁶ Unfortunately these statutes are not as clear on this point as they could be. This may be because the purpose of these statutes was not to allocate the ownership of geothermal resources between the surface and mineral estates, but rather to prevent geothermal resources from being entangled in the complicated body of law governing water and minerals in those states.⁶⁷ To remove the possibility of misunderstanding or uncertainty, it may be advisable for the legislatures of Idaho, Montana, and Washington to consider specifically the problem of geothermal ownership and to amend their statutes to create a presumption of ownership.

The Hawaii statute dealing with the reservation by the government of mineral rights states that geothermal resources come within the term "minerals" for purposes of such reservations.

In this chapter, if not inconsistent with the context: (1) "Minerals" means any or all of the oil, gas, coal, phosphate

65. IDAHO CODE § 42-4002(c) (1977).

66. This is often expressed in the Latin maxim *cujus est solum, ejus est esque ad coelum et ad inferos*. In many states this common law principle has been codified. *E.g.*, CAL. CIV. CODE § 829 (West 1972). The surface owners in *Geothermal Kinetics* advanced a similar argument, reasoning that since geothermal resources did not come within the definition of "minerals" and since the surface rights included everything except the minerals, they owned the geothermal resources. 75 Cal. App. 3d at 59-60, 141 Cal. Rptr. at 880.

67. The advantage of declaring geothermal resources to be

"of their own kind" is that the geothermal industry will not be bound by an anachronistic body of statutes and court decisions which have no valid relation to present day technology and development of this new energy source. The issue of ownership (public or private, surface owner or mineral reservation holder) will be left to state legislatures and courts without being confined by the water or mining laws, so long as no federal question is involved.

Bjorge, *supra* note 55, at 24. See also Kitchen, *supra* note 9, at 42-45; Aidlin, *Representing the Geothermal Resources Client*, 19 ROCKY MTN. MIN. L. INST. 27, 38-40 (1974).

. . . and, without limitation thereon, all other mineral substances and ore deposits whether solid, gaseous, or liquid, including all geothermal resources, in, on, or under any land, fast or submerged⁶⁸

This section is of limited value in construing private conveyances. While it may be argued that the statute reflects legislative intent concerning the resource in a general sense, the statute is not conclusive on this point and, consequently, will not reduce the likelihood of litigation. The Hawaii statute does not deal effectively with the problem of the allocation of geothermal resources among private parties.

While Wyoming has no geothermal statute, it includes geothermal water within its definition of underground water.⁶⁹ The statute in Nevada declares that "any water and steam encountered during geothermal exploration is subject to the appropriation procedures" of the state water law.⁷⁰ Thus, geothermal water in those states is subject to the rules that govern other water resources and its ownership is not based on the surface-mineral distinction. Unfortunately, the Wyoming and Nevada statutes make no provision for the mineral byproducts commonly found in geothermal water, so ownership to the resource as a whole is not settled.

In the remaining states with geothermal resource statutes—Alaska, Arizona, California, Colorado, Louisiana, New Mexico, Texas, and Utah—it may be possible to construct an argument that the legislature intended to include the resource within one estate or the other even though there is no specific reference to this point.⁷¹ A number of the states assign the super-

68. HAW. REV. STAT. § 182-1(1) (1976).

69. WYO. STAT. § 41-3-901(a)(ii) (1977).

70. NEV. REV. STAT. § 534A.040 (1973).

71. The Texas and New Mexico statutes suggest that the legislatures of those states believed that geothermal resources were included in the mineral estate. In the section of the Texas Civil Code which confers and defines the eminent domain powers of electrical generating entities, the following statement is made:

[N]o participating entity has . . . the power to take land or any interest therein, by exercise of the power of eminent domain, for the purpose of drilling for, mining, or producing from said land, any oil, gas, geothermal, geothermal/geopressured, lignite, coal, sulphur, uranium, plutonium, or other minerals belonging to another

TEX. REV. CIV. STAT. ANN. art. 1435a, § 4(2) (Vernon Supp. 1978). From this statute it could be inferred that the Texas Legislature has determined that geothermal resources are included within the mineral estate. It seems strange, however, that the legislature would have done this in such an oblique manner.

The New Mexico statute has an even more tenuous suggestion that geothermal resources should be considered part of the mineral estate. The section of the geothermal

vision of geothermal development to a particular governmental department. Giving this responsibility to the oil and gas board⁷² or the state water engineer,⁷³ for example, may indicate that the legislature thought the resource was mineral (oil and gas board) or nonmineral (water engineer). Another argument is that the inclusion of the chapter on geothermal resources in one part or another of the state code indicates a legislative intent to include geothermal resources within the mineral or surface estate. Additionally, some states specifically include within their statutory definition of geothermal resources minerals present in the geothermal water.⁷⁴ Because it specifically mentions minerals, such a definition of geothermal resources may in bootstrap fashion give the mineral owner some claim to all of the geothermal resources.

These arguments are unsettling because they fail to resolve the issue of geothermal ownership but do supply ammunition for the litigation that will be required to answer the question. State legislatures should speak directly to this problem instead of being satisfied with defining geothermal resources and delegating responsibility for them to a particular administrative body.

From this brief review of state geothermal resource statutes it is evident that only in Oregon is the rule unambiguously clear; in Idaho, Montana, and Washington the rule of ownership is probably apparent but could be made clearer; and in the remaining states with geothermal resource statutes, those statutes provide no certainty as to the ownership of geothermal resources. In these latter states, and in the balance of the fifty states, the legislatures should be encouraged to establish by statute a general rule that geothermal resources are presumptively the property of either the surface owner or the mineral owner, as Oregon has done.⁷⁵

resources chapter allowing or requiring a spacing unit for geothermal wells bears the heading "Spacing unit with divided mineral ownership." N.M. STAT. ANN. § 65-11-13 (Supp. 1975). Nothing in the remainder of the section suggests that geothermal resources are minerals, so any indication of legislative intent must be drawn solely from the heading. Even though the heading was part of the original legislative enactment, its reference to mineral ownership was probably only a slip and nothing should be implied from it.

72. This is the approach taken by Arizona, ARIZ. REV. STAT. § 27-652 (1956); California, CAL. PUB. RES. CODE § 3700 (West 1972); Colorado, COLO. REV. STAT. § 34-70-102 (Supp. 1977); New Mexico, N.M. STAT. ANN. § 65-11-2 (Supp. 1975); and Texas, TEX. NAT. RES. CODE ANN. tit. 5, § 141.011 (Vernon 1978).

73. This is the approach taken by Utah. UTAH CODE ANN. § 73-1-20 (Supp. 1977).

74. *E.g.*, N.M. STAT. ANN. § 65-11-3 (Supp. 1975): "[G]eothermal resources' means . . . all minerals in solution or other products obtained from naturally heated fluids, brines, associated gases and steam, in whatever form, found below the surface of the earth, but excluding oil, hydrocarbon gas and other hydrocarbon substances."

75. The establishment of such a rule may be followed by a challenge of the statute

B. Future Legislation

Although the courts' traditional approaches are ineffective in settling geothermal ownership without unacceptable delay, uncertainty, and expense, they do help to identify many factors legislatures should take into account in drafting a statutory presumption of ownership. A conscientious analysis of these factors in the geothermal context leads most naturally to the conclusion that the presumption should favor the mineral owner, and it is recommended that state legislatures adopt this position. Any resolution of the question, however, is preferable to none, and clear and unambiguous legislation giving the surface owner the rights to geothermal energy would also avoid the evils of ad hoc judicial determinations.⁷⁶

State legislatures should consider that geothermal resources, like mineral substances, are usually found underground. While some subsurface resources have been held not to be a part of the mineral estate,⁷⁷ as a general rule the mineral estate includes all underground substances of value.⁷⁸ Additionally, most geothermal fluids contain large amounts of extractable minerals. A strong argument can be made that these mineral byproducts are

on due process grounds by the party disfavored by the presumption. Such a challenge would be unlikely to succeed. The property of which the claimant would be deprived, without language specifically granting or reserving the geothermal resources, is only the expectation that, under common law rules, he may be awarded the geothermal resources by a court. The property owner will not be heard to complain if the common law is changed by statute, for "no one has a vested right in any particular rule of the common law." *Truax v. Corrigan*, 257 U.S. 312, 329 (1921). Furthermore, within the meaning of the fourteenth amendment, "a deprivation of property without due process of law occurs when it results from the arbitrary exercise of power, inconsistent with 'those settled usages and modes of proceeding existing in the common and statute law of England before the emigration of our ancestors.'" *Tracy v. Ginzberg*, 205 U.S. 170, 178 (1907) (emphasis added). Because there are reasonable grounds upon which a legislature may establish a rule of ownership, such a classification cannot be termed an arbitrary exercise of power, and consequently, laying down a rule that geothermal resources are within the surface or mineral estate is not a deprivation of property without due process.

76. The Oregon statute, of course, creates a presumption in favor of the surface owner. To date there are no reported opinions in Oregon challenging that statute or questioning the rights of surface owners to geothermal resources.

One advantage of giving the surface owner the rights to geothermal energy is that such an allocation may promote the application of geothermal resources for space heating and other agricultural and domestic uses. This would be especially true in cases where the lower temperature of the water or other circumstances make impractical the construction of an electrical generating plant.

77. Subterranean water is often said not to be included within the mineral estate, although the decisions are not consistent. See notes 35-36 and accompanying text *supra*.

78. See, e.g., *Sellers v. Ohio Valley Trust Co.*, 248 S.W.2d 897 (Ky. 1952); *Acker v. Guinn*, 464 S.W.2d 348, 352 (Tex. 1971); *Humphreys-Mexia Co. v. Gammon*, 113 Tex. 247, 254 S.W. 296 (1923); *Sult v. A. Hochstetter Oil Co.*, 63 W. Va. 317, 61 S.E. 307 (1908).

the property of the mineral owner.⁷⁹ It would greatly simplify questions of ownership if the rights to all underground resources, especially those containing mineral byproducts, were the property of the mineral owner.

State legislatures should also take into account the fact that the production of geothermal resources is very similar to the production of oil and gas, substances now generally considered minerals. Geothermal resources, like oil and gas, are in most cases attractive for use as an energy source. The predominant method for extracting geothermal resources is through the drilling of wells, using techniques similar to oil and gas extraction.⁸⁰ Many states already regulate the development of geothermal energy by spacing and unitization,⁸¹ concepts adapted from oil and gas law. Furthermore, it has been held that owners of geothermal wells qualify for the oil and gas depletion allowance under federal income tax laws.⁸² These strong similarities suggest that the mineral owner should possess the ownership rights to the geothermal resources.

Finally, it must be recognized that, because it is the only decision on the issue whether geothermal resources belong to the mineral owner or the surface owner, the *Geothermal Kinetics* case will undoubtedly have an enormous impact on the development of geothermal resources law. Because of this influence, an approach consistent with the *Geothermal Kinetics* holding will be less likely to be challenged in the courts and will thus yield more stability to the law. Future state statutes should establish the presumption that geothermal resources are the property of the owner of the mineral estate.

V. CONCLUSION

There is an immediate need for the development of geother-

79. Not only are these minerals underground substances of value, they are also elements commonly considered minerals. For instance, the water taken from the *Geothermal Kinetics* well contains aluminum, copper, chromium, iron, lead, magnesium, manganese, mercury, nickel, zinc, and sulfur. *Geothermal Kinetics, Inc. v. Union Oil Co.*, No. 75314, slip op. at 8 (Super. Ct. for the County of Sonoma, Cal., June 1, 1976). *But see* *Stephen Hays Estate v. Togliatti*, 85 Utah 137, 38 P.2d 1066 (1934), which held that the surface owner was entitled to surface water containing copper in solution. The copper came from tailings abandoned by upstream miners, and was obtained by a precipitation process.

80. *See generally* *Geothermal Kinetics, Inc. v. Union Oil Co.*, 75 Cal. App. 3d at 60, 141 Cal. Rptr. at 881; Olpin, *supra* note 9, at 128.

81. *E.g.*, Colorado, COLO. REV. STAT. § 34-70-104 (Supp. 1977); New Mexico, N.M. STAT. ANN. §§ 65-11-11, 12-13 (Supp. 1975); Texas, TEX. NAT. RES. CODE ANN. tit. 5, § 141.078 (Vernon 1978).

82. *Reich v. Commissioner*, 454 F.2d 1157 (9th Cir. 1972).

mal resources, especially as an alternative energy source. To meet that need, the question of the ownership of this resource must be settled quickly and definitively. Reliance on the courts and their traditional approaches will not achieve the objectives of certainty of ownership and expeditious development; instead, confusion and delay will be the result. With one exception, the state legislatures have not dealt effectively with this problem. The legislatures should establish a general rule that geothermal resources are presumptively within one estate or the other when the minerals have been severed from the surface. This presumption should be overcome only by specific and direct language expressing a contrary intention. Because including geothermal resources within the mineral estate would simplify questions of ownership of underground resources, would reflect the strong similarity between geothermal resources and oil and gas, and would be consistent with the holding in *Geothermal Kinetics*, it is suggested that the legislative presumption favor the mineral owner.

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